

execution of a *contractual* relationship between the parties. In their survey of the emerging economic literature on the economic aspects of property rights, Furubotn and Pejovich point out that

... Though sometimes forgotten, there should be no confusion about the fact that both trade and production involve *contractual arrangements*; these activities exist not so much to accomplish the exchange of goods and services but to permit the exchange of 'bundles' of property rights. Permission to do things with the goods and services is at issue.<sup>15</sup>

The literature on the economics of property rights does not simply highlight the inherent legal component of a transaction, i.e., the transfer or passage of title, as part of the act of exchange. Rather, property rights are viewed more broadly, with emphasis on the economic implications of different property rights assignments. The economics of property rights emphasizes that the definition and establishment of such rights will influence the incentives and behavior of participants in the exchange relationship. Property rights viewed from an economic perspective acquire a special meaning. Furubotn and Pejovich emphasize that

... A central point noted is that property rights do not refer to relations between men and things but, rather, *to the sanctioned behavioral relations among men that arise from the existence of things and pertain to their use*. Property rights assignments specify the norms of behavior with respect to things that each and every person must observe in his interactions with other persons, or bear the cost for nonobservance. The prevailing system of property rights in the community can be described, then, as the set of economic and social relations defining the position of each individual with respect to the utilization of scarce resources.<sup>16</sup>

The economics of property rights examines how the content of property rights affects the allocation of resources in specific and predictable ways.<sup>17</sup> The realization of static and dynamic economic efficiency in market transactions is influenced, therefore, by how property rights are established. In general, a more complete specification of property rights in a given exchange context diminishes uncertainty

<sup>14</sup> The concept of property rights as discussed in this paper is used solely within an economic context to derive the economic implications of alternative assignments of such rights by society. As shown in the text, both the definition of property rights and the usage of the term within this paper follow the academic economic literature on the topic. Such definition and usage of the concept may differ, however, in substantial respects from standard legal usage and interpretation of the same term.

<sup>15</sup> Eirik G. Furubotn and Svetozar Pejovich, "Property Rights and Economic Theory: A Survey of Recent Literature," *Journal of Economic Literature* 10 (December 1972):1139. (Emphasis in the original; footnote citation omitted.)

<sup>16</sup> *Ibid.* (Footnote citation omitted; emphasis in the original.)

<sup>17</sup> *Ibid.*

and tends to promote the efficient allocation and use of resources.<sup>18</sup> Moreover, changes in technology and improvements in the productivity of the inputs of production can create pressure for a further specification or redefinition of property rights.<sup>19</sup>

Three categories of property rights are commonly distinguished, namely, (1) the rights to use an asset, i.e., the socially-permissible potential uses of the asset, including the right to transform the asset physically or even destroy it; (2) the right to earn income from the asset; and (3) the right to transfer permanently the ownership rights to another party.<sup>20</sup> The right to transfer ownership may involve *all rights* through outright sale of the asset or only *some rights* through a lease or rental agreement. In the telecommunications industry, the transfer of *partial* or *limited rights* through market exchange is especially important, since such limited rights are what a regulated common carrier, such as a LEC, ordinarily provide its customers.

Ordinarily, it is the role of government in capitalist societies to define and enforce property rights. Additionally, it is also the role of government to *attenuate* such property rights under appropriate circumstances. Property rights are *unattenuated* if "... restrictions on individual rights to use, to earn income from, and to exchange assets are absent, except that the individual does not have the right to cause *physical* damage to the resources of others."<sup>21</sup> Government efforts to attenuate property rights may involve substantial complexity, especially in the presence of *spillover effects* or *externalities*. Externalities refer to unintended consequences of certain actions or behavior that may have beneficial or detrimental effects on third parties.

An instructive example of the attenuation of property rights by government is provided by the concept of a *public utility*.<sup>22</sup> In reviewing state and federal statutes, courts have attempted to delineate which businesses are "affected with a public interest" such that the property rights of owners of such enterprises may be conditioned, attenuated, or otherwise constrained in specific ways by society. In

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<sup>18</sup> *Ibid.*, p. 1141.

<sup>19</sup> See Harold Demsetz, "Toward a Theory of Property Rights," *American Economic Review* 57 (May 1967):350.

<sup>20</sup> See Thrainn Eggertsson, *Economic Behavior and Institutions* (Cambridge, U.K.: Cambridge University Press, 1990), pp. 34-35.

<sup>21</sup> *Ibid.*, p. 38. (Emphasis in the original.)

<sup>22</sup> A standard discussion of the concept of a public utility and its historical evolution is provided by Paul J. Garfield and Wallace F. Lovejoy, *Public Utility Economics* (Englewood Cliffs, N.J.: Prentice-Hall, 1964), Chapter 1.

general, the property rights of firms defined as public utilities, such as electric power companies, natural gas companies, and LECs, are modified by society to establish certain *rights* and *obligations* that are granted and imposed, respectively, on the public utility firm.<sup>23</sup>

Table 2 identifies the major rights and obligations that society typically imposes on the property rights of owners of firms classified as a public utility. As summarized in Table 2, the rights and obligations of public utilities constitute a coherent economic paradigm that restricts or curtails the exercise of certain property rights by owners of the public utility firm. The full development of the modern concept of a public utility evolved over many years, representing a synthesis of common law principles, judicial opinions, and state and federal statutes.<sup>24</sup> The definition and attenuation of property rights are not immutable and tend to evolve through time in response to economic, technological, and political changes. Today, the public utility concept is confronting major challenges as regulatory commissions increasingly allow the market entry of new firms to compete with franchised monopolies.

The history of the domestic telecommunications industry provides dramatic evidence showing how changes in property rights affect market structure and performance. Following the expiration of the original Bell patents in 1893 and 1894, the number of independent telephone exchanges increased from 154 in 1894 to 4,017 in 1902; the number of independent telephones increased from 15,000 to 970,000; and the percentage of telephones operated by non-Bell, independent telephone companies increased from 6% to 44%.<sup>25</sup>

Rights	Obligations
To charge reasonable prices for service that recover the total cost of production, including a reasonable return on capital invested.	To supply all reasonable demands for service by those who can pay for it.
To render service subject to reasonable rules and regulations.	To provide safe and adequate service to customers.
To receive a franchise providing the public utility with an exclusive right to serve a specific service area free from competition from other firms.	To charge just and reasonable prices for service.
When necessary, to exercise the power of eminent domain to condemn private property for public use for just compensation.	To serve all customers on equal terms.
	To obtain approval from the regulatory authority before changing a service or expanding into a new market.
	To exercise care to protect public safety.
	To obtain approval from the regulatory authority before terminating a service or abandoning a market.

Table 2—Rights and Obligations of Public Utilities

<sup>23</sup> For further discussion, see *ibid.*, pp. 12-13.

<sup>24</sup> See *ibid.*, pp. 3-11.

Thus, the expiration of an exclusive property right, i.e., Alexander Graham Bell's original telephone patents, triggered a dramatic change in the emerging market for local telephone services as new firms entered the telephone industry. Such new firms provided direct competition with the incumbent Bell Operating Companies, often competing in the same exchange area in the major cities as the incumbent firm and eventually forcing the Bell company to reduce its rates to consumers.<sup>26</sup>

The further development of competition in the markets for local exchange service was stifled, however, by Bell's strategy of purchasing its competitors and the refusal of the Bell Operating Companies to interconnect their local exchange networks with those of its competitors.<sup>27</sup> Bell's suppression of potential market exchange in the property rights defining local exchange interconnection, i.e., Bell's unwillingness to offer and accept payment for "renting" its property rights in interconnection to its competitors, profoundly affected the economic organization of early twentieth-century markets for local telephone service. Had public policy attenuated Bell's property rights and mandated that the Bell Companies interconnect both their local and long distance networks with those of competitors, competition in the market for local telecommunications services may have developed nearly 100 years sooner.<sup>28</sup>

Two other examples of changes in property rights illustrate their dramatic effects on the emergence of competition in the domestic telecommunications industry, namely, (1) the development of competition in the terminal equipment or customer premises equipment (CPE) market; and (2) the emergence of competition in the market for long distance telecommunications services.<sup>29</sup> Prior to implementation of

<sup>25</sup> Robert Bornholz and David S. Evans, "The Early History of Competition in the Telephone Industry" in *Breaking Up Bell: Essays on Industrial Organization and Regulation*, ed. David S. Evans (New York: North-Holland, 1983), p. 15.

<sup>26</sup> *Ibid.*, p. 20.

<sup>27</sup> *Ibid.*, p. 13.

<sup>28</sup> Distinctly-different property rights may interact to produce undesirable behavioral incentives. Bell's refusal to interconnect with competitors may have been the consequence of the exclusive monopoly franchise granted to the Bell Operating Company by local governments. It is plausible, however, that the Bell Operating Companies would have had strong incentives to interconnect with their competitors in the *absence* of a monopoly franchise. Interconnection with competitors would have produced additional revenues and increased the value of Bell Operating Company assets, since their networks would have effectively reached more customers. As a result, a policy of open entry may have had the same effect as a policy mandating interconnection among competitors.

<sup>29</sup> The standard reference discussing the development of competition in these markets as of

the FCC's policy permitting the attachment of non-Bell CPE to the public switched network, the Bell System viewed terminal equipment as an essential component of the nationwide telephone system itself. Therefore, terminal equipment, although physically separate and distinct from local exchange switching and transmission facilities, was nevertheless "hard wired" into the LEC's local loop plant. The FCC's decision permitting the attachment of non-Bell CPE to the public switched network effectively redefined the outer boundary of the public switched network by revoking, in effect, Bell's *implicit* exclusive property right that empowered the Bell system, *not* the customer, to determine what kind of terminal equipment may be attached to LEC facilities.<sup>30</sup>

In 1975, the FCC adopted a registration and certification program that prescribed that CPE would be attached to the public switched network using standard plugs and jacks rather than "hard-wiring" the terminal equipment to telephone company loop plant. The program required that all CPE connected to the public switched network, including all terminal equipment manufactured by telephone companies themselves, must meet uniform technical criteria to avoid harm to telephone company facilities. Although the telephone companies appealed the FCC's registration and certification program, the appeals court upheld the FCC's decision establishing the program. In 1977, the Supreme Court refused to review the decision of the appeals court. This refusal eliminated the uncertainty surrounding the FCC's CPE registration program and definitively established a new property right allowing telephone customers to connect any type of CPE to the public switched network so long as it complied with Part 68 of the Commission's rules. As a consequence, competition in the CPE market developed rapidly.

The development of competition in the market for long distance telecommunications also depended in a critical way on the establishment of a definitive property right allowing the other common carriers (OCCs) to originate and terminate interstate telecommunications using Bell System local exchange facilities. Prior to the divestiture of the Bell Operating Companies from AT&T in 1984, the concept of *carrier access* to local exchange facilities was ambiguous. From the perspective of the pre-divestiture Bell System, carrier access to local exchange facilities had little meaning.

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the late 1970s is Gerald W. Brock, *The Telecommunications Industry: The Dynamics of Market Structure* (Cambridge, Mass.: Harvard University Press, 1981), Chapters 8 and 9.

<sup>30</sup> For a discussion of the FCC's decisions that authorized the attachment of non-Bell CPE to the public switched network, see *ibid.*, Chapter 9.

Vertical integration between local and long distance telephone service meant that no "market boundary" existed between the Bell Operating Companies, the independent telephone companies, and AT&T Long Lines. The concept of carrier access to local exchange facilities was only "implicit" in the Bell System's vertically-integrated, end-to-end industry structure and certainly had no meaning for the OCCs that were not members of the Bell System "industry partnership" with the independent telephone companies.

As a consequence of (1) the FCC's decisions in CC Docket 78-72 that established in principle and practice the concept of OCC carrier access to Bell Operating Company local exchange facilities together with (2) the "equal access" provision of the 1982 AT&T Consent Decree with the U.S. Department of Justice, a property right in carrier access to local exchange facilities was firmly established.<sup>31</sup> With the elimination of the acute uncertainty surrounding the lawfulness and availability of carrier access and its price, competition in the market for interstate long distance telephone service was finally able to develop, a dynamic process that continues to this day.

The discussion of this section suggests several conclusions concerning the establishment of property rights and the emergence of competition in U.S. telecommunications services:

1. The establishment of property rights in interconnection with and access to incumbent local exchange carriers is a necessary condition (although not necessarily sufficient) for the development of competition in U.S. telecommunications markets.
2. Although property rights have important implications for achieving an economically-efficient allocation of resources and fostering the emergence of competitive markets, the process of identifying, defining, and implementing such rights involves extensive legal and regulatory proceedings. Since such processes are constrained by law and the Constitution to provide due process, the establishment of new property rights to permit competition to develop necessarily takes a long time, i.e., years, not months.
3. Property rights affecting economic transactions in particular and market exchange in general change through time. Industry structure and organization based on an existing property rights paradigm will change as a consequence of the emergence of new property rights. Although the public utility concept established the right of a franchised monopolist to operate free from direct competition, government, through its regulatory agencies, has gradually revoked this property right protecting the incumbent monopolist.

<sup>31</sup> For a summary of the various FCC decisions and the litigation brought by MCI leading up to the FCC's access charge decisions in CC Docket 78-72, see Walter G. Bolter, Jerry B. Duvall *et al.*, *Telecommunications Policy for the 1980s: The Transition to Competition* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., for the Washington Program of the Annenberg Schools of Communications, 1984), pp. 346-348.

4. During the early years of the emergence of competition in telecommunications markets, regulatory commissions should be alert to ill-defined property rights and initiate appropriate proceedings to identify, define, and enforce such rights as may be necessary to establish these critical prerequisites for competitive markets.

### 2.2.2 *Effectuating Efficient Governance Structures for Competitive Local Telecommunications Markets*

A central theme of transaction cost economics is that markets and the internal organization of business firms are alternative institutional arrangements for completing transactions.<sup>32</sup> What determines which mode will be used to effectuate a transaction in a given set of circumstances? What factors cause transactions to be removed from markets and completed as internal exchanges within a firm? Transaction cost economics provides a framework for answering such questions. The following discussion reviews certain key ideas of transaction cost economics. These concepts are then used to discover potential transactional problems that may frustrate the emergence of competitive markets for local telecommunications services.

The *establishment* of the required property rights in interconnection and local exchange access is just the *first* step in creating the institutional foundation essential for the evolution of competition in local telecommunications markets. Once established, such property rights should be exchanged between buyer and seller in ways that *minimize* the transaction cost of doing so. Recent research on transaction cost economics suggests, however, that certain *attributes* of a transaction may create barriers that impede or totally block voluntary exchange between buyer and seller if the transaction is attempted through the market mechanism. As a result, the evolution of competitive markets for local telecommunications service may be thwarted or foreclosed entirely. It is essential, therefore, to recognize those characteristics of a transaction that pose hazards to voluntary market exchange. Such an analysis of the key attributes of transactions also illuminates the possible role of regulation as a process for alleviating transactional barriers.

#### 2.2.2.1 *Elements of Transaction Cost Economics*

Transaction cost economics explains why different transactions may be completed in different ways. Transactions differ in three major respects,<sup>33</sup> namely, (1) *asset specificity*; (2) *uncertainty*; and (3) *frequency*. Although asset specificity is the most important characteristic, the remaining two characteristics play a significant role in determining how a specific transaction will be completed.<sup>34</sup>

<sup>32</sup> This theme was first advanced by Ronald H. Coase in "The Nature of the Firm," *Economica* 4 (1937):386-405.

<sup>33</sup> Williamson, *The Economic Institutions of Capitalism*, p. 52.

Asset specificity refers to the extent of specialization embedded in a physical asset or in the human capital of employees that may form an essential component of a transaction. Some assets may be highly specialized with idiosyncratic attributes that are only useful for a very specific purpose. While such highly specialized assets may provide high-quality, cost-effective services for the unique application for which they were intended to serve, such assets may have little or no value in any other application.<sup>35</sup> As a result, investment in such assets represents a substantial risk to the owner if the buyers of the services of such assets should suddenly terminate a contractual relationship with the owner. The difficulties of writing contracts with acceptable *safeguards* to the owner of very specialized assets increases rapidly as the extent of asset specificity deepens. From a transaction cost perspective, this deepening of asset specificity is the major attribute of a transaction that leads to vertical integration of different stages of production within a firm.

General purpose or *non-specific* assets do not imply the same contracting hazards as do specific assets. Non-specific assets may be readily redeployed to other applications and, as a result, do not present the difficult contracting problems as do highly-specialized assets. Williamson summarizes the nature and the transaction cost implications of asset specificity as follows:

... (1) [A]sset specificity refers to durable investments that are undertaken in support of particular transactions, the opportunity cost of which investments is much lower in best alternative uses or by alternative users should the original transaction be prematurely terminated, and (2) the specific identity of the parties to a transaction plainly matters in these circumstances, which is to say that continuity of the relationship is valued, whence (3) contractual and organizational safeguards arise in support of transactions of this

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<sup>34</sup> The following discussion of the key concepts of transaction cost economics closely follows Williamson's seminal reference, *The Economic Institutions of Capitalism*. Although Williamson is the dominant figure in contemporary writing on transaction cost economics, other academic researchers are expanding the scope of this analysis, both theoretically and empirically. See, for example, Benjamin Klein, R.A. Crawford and A.A. Alchian, "Vertical Integration, Appropriable Rents and the Competitive Contracting Process," *Journal of Law and Economics* 21 (October 1978):297-326; Sanford J. Grossman and Oliver D. Hart, "The Cost and Benefits of Ownership: A Theory of Vertical and Lateral Integration," *Journal of Political Economy* 94 (August 1986):691-719; and Paul Joskow, "Asset Specificity and the Structure of Vertical Relationships: Empirical Evidence," *Journal of Law, Economics, and Organization* 4 (Spring 1988):96-118.

<sup>35</sup> In the recent literature on contestable markets, such special-purpose or unique assets represent *sunk costs*. Baumol, Panzar, and Willig explain that a sunk cost "... cannot be eliminated, even by total cessation of production. As such, once committed, sunk costs are no longer a portion of the cost of production." See Baumol, Panzar, and Willig, *Contestable Markets and The Theory of Industry Structure*, p. 280.



kind, which safeguards are unneeded (would be the source of avoidable costs) for transactions of the more familiar neoclassical (nonspecific) variety . . . .<sup>36</sup>

Williamson identifies four different types of asset specificity, namely, (1) *site specificity*; (2) *physical asset specificity*; (3) *human asset specificity*; and (4) *dedicated assets*.<sup>37</sup> The choice of completing transactions *within* a firm, or what Williamson calls "hierarchy," rather than using market exchange as the transaction cost-minimizing transactional mode, or what may be called a *governance structure*, varies with the specific type of asset specificity.<sup>38</sup> Briefly, site specificity refers to successive stages in production that are " . . . located in a cheek-by-jowl relation to each other so as to economize on inventory and transportation expense . . . ."<sup>39</sup> Physical asset specificity refers to specialized equipment used to produce a certain output. Human asset specificity refers to the enhancement of human capital as a consequence of learning-by-doing on the job. Finally, dedicated assets represent investments in additional productive capacity to meet the market demand of a specific customer. The transactional hazards implied by this type of asset specificity, however, can often be overcome by expanding the contractual relationship between the producer and customer.

<sup>36</sup> Williamson, *Economic Institutions of Capitalism*, p. 55.

<sup>37</sup> *Ibid.*

<sup>38</sup> The concept of *governance structure* is used in a specialized sense in transaction cost economics and does not refer to "government" in the ordinary political sense of the term. A governance structure refers to an institutional arrangement or process that facilitates voluntary exchange between trading parties. The notion of an institution is itself a subtle concept and is implied by the concept of a governance structure. As Douglas North explains,

Institutions are the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions and codes of conduct), and formal rules (constitutions, laws, property rights). Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange. Together with the standard constraints of economics they define the choice set and therefore determine transaction and production costs and hence the profitability and feasibility of engaging in economic activity. They evolve incrementally, connecting the past with the present and the future; history in consequence is largely a story of institutional evolution in which the historical performance of economics can only be understood as a part of a sequential story. Institutions provide the incentive structure of an economy; as that structure evolves it shapes the direction of economic change towards growth, stagnation or decline. . . .

See Douglas C. North, "Institutions," *Journal of Economic Perspectives* 5 (Winter 1991):97.

<sup>39</sup> Williamson, *Economic Institutions of Capitalism*, p. 95.

Before considering uncertainty and frequency as the two other important dimensions of a transaction, two major behavioral assumptions inherent in transaction cost economics must be identified, namely, (1) *bounded rationality*; and (2) *opportunism*. Both assumptions directly affect the extent of transaction cost. Following Herbert Simon, bounded rationality means that the behavior of individuals in an exchange relationship is "*intendedly* rational, but only *limitedly* so."<sup>40</sup> This concept of rationality recognizes that individuals behave rationally, but only within the limits of "cognitive competence."<sup>41</sup>

Opportunism is defined as "self-interest seeking with guile."<sup>42</sup> Opportunism includes blatant forms of behavior, such as lying, stealing, and cheating. More generally, opportunism refers to "... the incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse."<sup>43</sup> Opportunism is responsible for problems of information asymmetry between or among parties to a transaction. Ordinarily, conventional economic analysis of market exchange assumes fully-rational maximizing behavior on the part of both buyer and seller, where all information and cognitive capacity for such behavior are completely available. Similarly, conventional economic analysis makes the assumption that all parties to a transaction are never deceitful and always "play by the rules." Relaxing both assumptions to admit the assumption of bounded rationality and opportunism permits the identification of potential barriers to effectuating a transaction in a realistic bargaining context.

Although asset specificity is the most important attribute of a transaction that governs the relative efficiency of hierarchy versus market exchange as alternative governance structures for completing a transaction, both uncertainty and transaction frequency matter. Indeed, Williamson remarks that "... asset specificity only takes on importance in conjunction with bounded rationality/opportunism and in the presence of uncertainty. . . ."<sup>44</sup> With respect to uncertainty, transactions completed internally within a firm as opposed to using contracting through the market differ in their capacity to deal with transactional disturbances. If bounded rationality did *not* exist, then all possible disturbances could be fully anticipated and appropriate rules

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<sup>40</sup> *Ibid.*, p. 30, quoting Herbert Simon. (Emphasis in the original.)

<sup>41</sup> *Ibid.*, p. 45.

<sup>42</sup> *Ibid.*, p. 30.

<sup>43</sup> *Ibid.*, p. 47.

<sup>44</sup> *Ibid.*, p. 56.

for dealing with them could be included in a contract. Even then, however, opportunism on the part of one or more of the contracting parties may make actual implementation of the rules hazardous. As a result, the uncertainty implied by disturbances may doom the usage of contracts as a transactional mode and lead directly to use of hierarchy and vertical integration rather than relying on a contract, i.e., market exchange, to effectuate a transaction.

Not all uncertainty is the same, however. In particular, *behavioral uncertainty* is especially important in understanding transaction cost issues. Behavioral uncertainty is *strategic* in nature and is directly attributable to opportunism. As Williamson explains,

. . . [E]ven if it were possible to characterize the general propensity of a population to behave opportunistically in advance and perhaps even to screen for trustworthiness, knowing that one is dealing with a trader who comes from one part of the opportunism distribution rather than another does not fully describe the uncertainties that arise on this account. Those added uncertainties can be evaluated only upon projecting the devious responses (and own replies) that opportunism introduces. And those can be evaluated only in conjunction with the particulars of the contract. Even knowledge of particulars, moreover, does not preclude surprises. The capacity for novelty in the human mind is rich beyond imagination . . . .<sup>45</sup>

Given the enormous scope for strategic human behavior, the limits of cognitive capacity imposed by bounded rationality are rapidly reached. As a result, behavioral uncertainty can pose major hazards to the use of markets for completing transactions.

The criticality of behavioral uncertainty is closely linked to asset specificity. Williamson observes that

. . . [A]n increase in parametric uncertainty is a matter of little consequence for transactions that are nonspecific. Since new trading relations are easily arranged, continuity has little value, and behavioral uncertainty is irrelevant. Accordingly, market exchange continues and the discrete contracting paradigm holds across standardized transactions of all kinds, whatever the degree of uncertainty.

That is no longer so for transactions that are supported by idiosyncratic investments. Whenever assets are specific in nontrivial degree, increasing the degree of uncertainty makes it more imperative that the parties devise a machinery to 'work things out'—since contractual gaps will be larger and the occasions for sequential adaptations will increase in number and importance as the degree of uncertainty increases. . . .<sup>46</sup>

The frequency of transactions affects the costliness of using hierarchy rather than the market to effectuate transactions. In that sense, transaction costs are no different

<sup>45</sup> *Ibid.*, p. 58. (Footnote reference omitted.)

<sup>46</sup> *Ibid.* pp. 59-60.

from the cost of production in general. To the extent that hierarchy represents a fixed cost, then economies of density are achieved as the number of transactions increases.

Williamson notes that

... [s]pecialized governance structures [e.g., hierarchy] are more sensitively attuned to the governance needs of nonstandard transactions than are unspecialized structures, *ceteris paribus*. But specialized structures come at a great cost, and the question is whether the costs can be justified. This varies with the benefits on the one hand and the degree of utilization on the other.<sup>47</sup>

Once again, the extent of asset specificity is the key attribute of the transaction that must be considered in conjunction with the implications of transaction frequency.

### **2.2.2.2 Application of Transaction Cost Concepts to Transactional Problems in Local Telecommunications Markets**

The foregoing review of some of the key concepts of transaction cost economics provides a sufficient context for a basic understanding of possible transactional barriers that may be encountered in the emergence of competition in local telecommunications markets. Appendix B provides additional details about transaction cost economics that deepen one's understanding of the fundamental ideas, although such details are not absolutely essential for following the logic of transaction cost arguments developed in this paper.

Given the foregoing discussion, it is now possible to identify contractual difficulties that are likely to impede the emergence of competition in markets for local telecommunications services. Although such contractual difficulties may directly affect end-users, the major problems are most likely to involve contractual relationships between the LECs and their competitors. Two potential problems are emphasized, namely, (1) dominant firm strategic behavior; and (2) inefficient industry structure. The discussion of each problem assumes that property rights in local exchange access and interconnection as discussed in Section 2.2.1 have been identified and recognized by the FCC, at least provisionally subject to judicial review.

*Dominant Firm Strategic Behavior.* If one party to a transaction possesses substantial market power, opportunistic behavior can pose a serious barrier to effectuating business transactions using market exchange. For the party with market power, opportunism may amplify itself into *strategic behavior*, i.e., "... efforts by dominant firms to take up and maintain advance or preemptive positions and/or to respond punitively to rivals."<sup>48</sup> Both preemptive and punitive dominant firm strategic behavior is intended to deter market entry of competitors and otherwise suppress

<sup>47</sup> *Ibid.*, p. 60.

<sup>48</sup> Williamson, *The Economic Institutions of Capitalism*, p. 128.

competitive rivalry with the dominant firm.<sup>49</sup> An example of dominant firm preemptive strategic behavior would be forward integration into another stage of production where the transaction cost savings are negligible, thereby deterring potential rivals that plan to supply the market at this stage of production. An example of punitive behavior would be predatory pricing that "disciplines" the pricing policy of established rivals and may frighten away potential rivals. Viewed from the perspective of the S/C/P paradigm, dominant firm strategic behavior is intended to influence industry structure to the advantage of the incumbent firm and to the disadvantage of potential or actual rivals that might compete with the dominant firm.<sup>50</sup>

The economic literature on strategic behavior has a controversial history. Some writers have insisted that such behavior, especially predatory pricing, is inherently irrational and, therefore, unlikely to occur in real-world markets.<sup>51</sup> Conversely, other writers ascribe any form of dominant firm behavior that deviates from conduct anticipated in a perfectly competitive market as revealing strategic intent and purpose.<sup>52</sup> The economic literature on dominant firm strategic behavior has advanced considerably over the last decade or so, such that major objections to the early literature have now been addressed.<sup>53</sup>

Based on the advances in the recent economics literature, strategic behavior merits public policy scrutiny in industries described as (1) the sitting monopolist/duopolist situation; (2) regulated monopolist; (3) dominant firm industries; and (4) certain

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<sup>49</sup> The business logic of dominant firm strategic behavior is only fully apparent when perceived as a long term business strategy. By foregoing short term profits or even absorbing short term losses as a consequence of strategic behavior, the dominant firm is, in effect, investing in the future: greater profits will be realized or ordinary profits will be protected from competitive erosion in the future as a result of actions that the dominant firm takes to shape market structure to its advantage, i.e., deter new entrants and "discipline" existing competitors. Establishing a credible threat to compete aggressively against all new entrants may be sufficient to protect the dominant firm from erosion of future profits.

<sup>50</sup> Such conduct is represented by the feedback loops in Figure 2.

<sup>51</sup> See, for example, the classic article by John S. McGee, "Predatory Price Cutting: The Standard Oil (N.J.) Case," *Journal of Law and Economics* 23 (October 1958):137-169.

<sup>52</sup> Williamson refers to this perspective as the "inhospitality approach" to antitrust law enforcement. The conceptual basis for this perspective, according to Williamson, is the "applied price theory" approach to industrial organization analysis that dominated economic thinking on the nature of competition during the period following World War II. See Williamson, *The Economic Institutions of Capitalism*, p. 26.

<sup>53</sup> *Ibid.*, p. 374.

oligopolies.<sup>54</sup> Clearly, LECs fall within an industry classification where strategic behavior may be objectionable from a public policy standpoint.

The recent literature on dominant firm strategic behavior has clarified several aspects of strategic conduct that may imply adverse public policy consequences. Williamson identifies four aspects of strategic behavior that now seem better understood compared to the early literature, namely,

... (1) Severe structural preconditions in both concentration and entry barrier respects need to be satisfied before an incentive to behave strategically can be claimed to exist; (2) attention to investment and asset characteristics is needed in assessing the condition of entry—specifically, nontrivial irreversible investments of a transaction specific kind have especially strong deterrent effects; (3) history matters in assessing rivalry—both with respect to the leadership advantage enjoyed by a sitting monopolist as well as in the incidence and evaluation of comparative costs; and (4) reputation effects are important in assessing the rationality of predatory behavior.<sup>55</sup>

Each of these aspects of dominant firm strategic behavior is likely to bear to a greater or lesser extent on the evolution of competition in markets for local telecommunications services.<sup>56</sup>

In general, transaction cost economics makes the rebuttable presumption that idiosyncratic behavior observed in the course of two or more parties attempting to complete a business transaction is attributable to efforts to minimize transaction cost. Opportunism is an essential behavioral assumption, but by and large, extreme opportunistic behavior is assumed to be attenuated by the larger goal of effectuating a beneficial transaction that minimizes transaction cost, especially during the *ex post* contracting period when a contract is executed. In other words, the conduct of parties in negotiating a contractual relationship is presumed to reflect efficiency purposes.<sup>57</sup>

The possibility of dominant firm strategic behavior obviously weakens the presumption that observed behavior among parties negotiating a transaction is predominately motivated by efforts to minimize transaction cost, i.e., to achieve economic efficiency in either production or consumption. Thus, in the presence of

<sup>54</sup> *Ibid.*

<sup>55</sup> *Ibid.*, p. 383.

<sup>56</sup> An overview of the emerging literature on formal models of strategic behavior is provided in the collection of papers in *New Developments in the Analysis of Market Structure*, eds. Joseph E. Stiglitz and G. Frank Mathewson (Cambridge, Mass.: MIT Press, 1986). Game theory has been used extensively to model certain types of strategic behavior of dominant firms. A clear, textbook treatment of some of this literature is provided by Jean Tirole, *The Theory of Industrial Organization* (Cambridge, Mass.: MIT Press, 1988), Chapter 9.

<sup>57</sup> Williamson, *The Economic Institutions of Capitalism*, pp. 28-29.

market power, it is a reasonable hypothesis that observed behavior in the process of effectuating a transaction represents some *combination* of efforts to minimize transaction costs *and* strategic behavior intended to disadvantage actual or potential rivals.

Understanding this combination of behavior has important consequences for implementing public policy to foster competitive markets. For example, the FCC may order a LEC to furnish a specific type of interconnection to a competitive access provider (CAP). From a transaction cost perspective, the LEC may object to the Commission's order and refuse to comply with it until its judicial appeals are exhausted for three reasons, namely,

- (1) *purely* for strategic purposes to deter completely the prospective entry of rivals or to force the exit of rivals that have already entered the market but now represent a serious competitive threat;<sup>58</sup>
- (2) *purely* for transaction cost-minimizing purposes, where supplying the ordered interconnection involves unacceptable risks to the LEC that were either ignored or inadequately addressed by rivals or the Commission;<sup>59</sup> or
- (3) some *combination* of reasons (1) and (2). Again, from a transaction cost perspective, a failure to give reason (3) careful and serious consideration during the process of regulatory review may inadvertently delay full compliance with the Commission's order

<sup>58</sup> The possibility of such dominant firm strategic behavior increases sharply if competitive entry threatens to make obsolete a large part of transaction-specific investment made by the incumbent firm prior to the entry of competitors. The problem may be especially acute if the dominant firm made such investment during an era when, as a regulated public utility, competition was both unanticipated and unlawful. The dominant firm has a clear financial incentive to protect the value of its sunk cost investment until its book cost has been amortized. Some LECs may face such a problem, or may claim that they do, either now or prospectively and may be expected, therefore, to pursue entry-detering strategies. Evaluation of the validity of such dominant firm claims of potential "stranded investment" may be difficult, however, although transaction cost economics provides useful guidance in this task. For a detailed discussion of sunk cost problems during the transition from a regulated monopoly to a competitive industry structure, see John R. Meyer and William B. Tye, "Towards Achieving Workable Competition in Industries Undergoing a Transition to Deregulation: A Contractual Equilibrium Approach," *Yale Journal on Regulation* 5 (Summer 1988):273-297.

<sup>59</sup> To the extent that competitors of LECs request types of local exchange interconnection or other special-purpose facilities that require the LEC to make transaction-specific investments, the LECs may have an incentive to resist such requests unless the competitor provides a "safeguard" that protects the LEC from a capital loss in the transaction-specific investment. This safeguard could take several forms, including a higher price for the service compared to a similar service that is provided using a general purpose technology. The transaction cost logic of safeguards is embodied in Williamson's concept of a "hostage" that is briefly discussed in Appendix B.

while the LEC pursues the lengthy process of judicial review.<sup>60</sup> As a result, Commission review of a petition for a specific type of LEC interconnection, facility, service, or functionality should include a study of the obstacles from a transaction cost perspective that will likely impede the transaction between the LEC and the CAP. After conducting such a review, the Commission could make a rebuttable presumption that continued efforts by the LECs to oppose the Commission's orders *after due consideration of transaction cost impediments and their remediation are addressed by the Commission* are due entirely to strategic purposes and should be ignored.

The actual analysis of potential impediments to voluntary exchange between an LEC and its rivals from a transaction cost perspective is shown in Figure 3.<sup>61,62</sup>

Suppose a LEC can supply a particular service or facility to a rival using two alternative technologies. One technology is "general purpose" in design and can be used to supply multiple LEC services. The second technology is "special purpose" in design and is optimized to provide a single LEC service. The special purpose technology requires greater investment in transaction-specific durable assets but is more efficient in providing the service for which it is intended compared to the general purpose technology.

Suppose  $k$  measures the extent of transaction-specificity embodied in assets. Thus,  $k = 0$  for transactions using the general purpose technology. Alternatively,  $k > 0$  for transactions using the special purpose technology. In this latter case, services provided by the LEC to its customers require investment in facilities that are uniquely specialized to meet the service requirements of the particular customer or class of customers. Premature termination of a contractual relationship between the LEC and the customer would impose a financial loss on the LEC, since, by definition, the technology is special purpose and implies a sunk cost to the LEC.

For transactions where  $k = 0$ , market exchange poses no transactional hazards to either the LEC or its customers. For transactions where  $k > 0$ , the parties to the

<sup>60</sup> From a public policy perspective, a competitor of the LEC should be willing to pay a tariff for using an LEC facility or service that reflects at least the incremental cost of the facility, including a share of the transaction costs of effectuating the transaction. As the history of IXC competition suggests, it is the *protracted delay* in receiving access of acceptable quality and type as much as price per se that impedes the development of competition. "Equal access" to LEC facilities is much more expensive to IXCs than line-side access to a local exchange switch, which was the only type of access available to OCCs during the early stages of interexchange competition. Nevertheless, it is higher-priced, higher-quality equal access that IXCs prefer in providing interexchange telecommunications services.

<sup>61</sup> Figure 3 reproduces Figure 1-2 in Williamson, *The Institutions of Capitalism*, p. 33.

<sup>62</sup> The following discussion follows Williamson's explanation of a simple contracting schema. See *ibid.*, pp. 32-35.



transaction have incentives to devise safeguards to protect the investment in assets specific to the transaction. The magnitude of such safeguards is represented by  $s$ . Where  $s = 0$ , no safeguards are provided; where  $s > 0$ , safeguards are provided.

Nodes A, B, and C in Figure 3 represent three contracting possibilities. A price,  $p$ , is associated with each node. It is assumed that the LEC is risk neutral; is prepared to supply its customers with either the general purpose or special purpose technology; and will accept any safeguard arrangement, so long as all relevant costs can be recovered. Node A represents a transaction using general purpose technology ( $k = 0$ ) with a projected break-even price equal to  $p_1$ . Node B represents a transaction using transaction-specific assets ( $k > 0$ ), where no safeguard is provided ( $s = 0$ ) and with a break-even price equal to  $\bar{p}$ . Node C represents a transaction using special purpose technology, but the customer of the LEC provides the LEC with a safeguard ( $s > 0$ ). As a result, the break-even price,  $\hat{p}$ , at node C is less than  $\bar{p}$  at node B.<sup>63</sup>

Protective safeguards for transactions using the special purpose technology may include one or more of three forms.<sup>64</sup>

One form of safeguard realigns incentives to protect the LEC's investment in transaction-specific investment and might include a severance payment or penalty for premature service termination by the LEC's customer. A second type of safeguard involves the creation of a specialized governance structure for

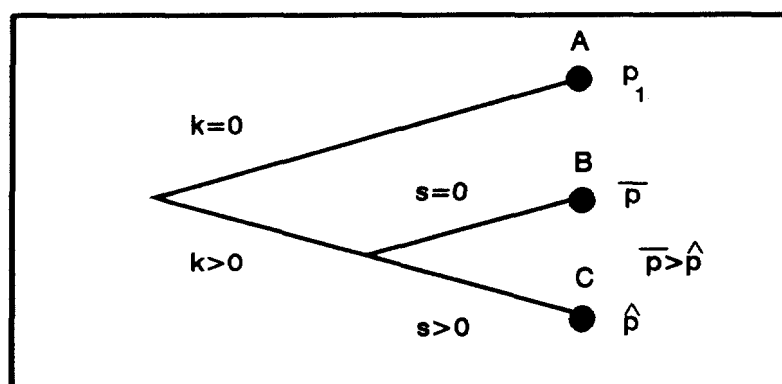


Figure 3—Williamson's Simple Contracting Schema

resolving contract disputes, such as an arbitration process rather than litigation. A third type of safeguard is the establishment of trading practices that both support and signal a desire to continue the trading relationship. One practice that supports longer term continuity in the relationship is reciprocal trading where the LEC and its customer agree to supply each other with specific facilities or services.<sup>65</sup>

Williamson's simple contracting scheme shown in Figure 3 emphasizes that technology ( $k$ ), contractual governance/safeguards ( $s$ ), and price ( $p$ ) are interactive and determined simultaneously. As Williamson explains,

<sup>63</sup> Ibid; p. 33.

<sup>64</sup> Safeguards to transactions will be of interest to *both* buyer and seller, although the seller has a clear interest in protecting transaction-specific investment. The buyer may have a clear interest as well in protecting the continuity of service provided by the seller.

<sup>65</sup> Williamson, *The Economic Institutions of Capitalism*, pp. 33-34.

... [T]ransaction cost economics maintains that contracts are triplets in which price, asset specificity and contracting safeguards are all determined simultaneously. Price does not speak in isolation but only in relation to contracting hazards and the associated safeguards. Specifically, contracts that pose hazards that are not mitigated by safeguards will be priced out differently than contracts where those same hazards are mitigated.<sup>66</sup>

The nature of this interactivity between and among prices, asset specificity, and contractual safeguards can be summarized as follows:

1. Node A transactions involving general purpose assets do not require protective governance structures. Transactions are workably and efficiently effectuated through impersonal competitive markets.
2. Transactions involving substantial investment in transaction-specific assets represent bilateral trade where customer identify matters to the seller.
3. Since node B transactions involve no safeguards, the break-even price,  $\bar{p}$ , is necessarily greater than the price,  $\hat{p}$ , for transactions at node C, where safeguards are provided. Node B transactions tend to be contractually unstable and tend to revert to node A, where general purpose technology is used, or node C where safeguards for using the special purpose technology are provided.
4. Node C transactions incorporate safeguards ( $s > 0$ ) and are, therefore, protected against expropriation hazards.
5. Since price and governance are linked, "... parties to a contract should not expect to have their cake (low price) and eat it too (no safeguard). More generally, it is important to study *contracting in its entirety*. Both the *ex ante* terms and the manner in which contracts are thereafter executed vary with the investment characteristics and the associated governance structure within which transactions are embedded."<sup>67</sup>

Various types of possible LEC strategic behavior can be illustrated in terms of Williamson's simple contracting schema. The following list is only illustrative of possible examples of strategic behavior that may adversely affect transactions between an LEC and a rival that is also a LEC customer.

1. The LEC may propose the use of an *existing* special purpose technology rather than the use of a general purpose technology to meet the access or interconnection requirements of a rival. The LEC may then insist on some transaction safeguard or a higher price in its absence such that the effective price paid by the rival is higher than if the service were provided using general purpose technology.<sup>68</sup>

<sup>66</sup> Oliver E. Williamson, "Contested Exchange Versus the Governance of Contractual Relations," *Journal of Economic Perspectives* 7 (Winter 1993):105.

<sup>67</sup> Williamson, *The Economic Institutions of Capitalism*, p. 35. (Emphasis in the original).

<sup>68</sup> This dominant firm strategy is an example of a broad class of strategic behavior intended to disadvantage a rival by raising the cost of production of a rival relative to the incumbent dominant firm. For further discussion of such a strategy, see Steven C. Salop and David T. Scheffman, "Raising Rivals' Costs," *American Economic Review* 73 (May 1983):267-71.

2. The LEC may propose to meet the interconnection requirements of a rival using a *new* special purpose technology that has not been used previously and is, therefore, not currently subject to price cap regulation. In developing the rate for such a new service, the LEC may establish a charge so high that the rival using the service or facility cannot expect to compete with the incumbent LEC that is already providing a similar service to end-users.<sup>69</sup>

3. The LEC may propose to meet the interconnection or other specialized local access requirements of a rival by "packaging" or "bundling" a general or special purpose technology with other LEC services and facilities not required by the rival.<sup>70</sup> This dominant firm bundling strategy may be intended to achieve a variety of purposes, including increasing profits through price discrimination or raising the effective cost of interconnection for the rival.<sup>71, 72</sup>

4. The LEC may propose to meet the interconnection requirements of a rival by strategically "defining" a service in such a way to disadvantage a rival. Thus, a general purpose technology is used to provide a "new service" that is technically identical to an existing service except for the name of the service and incidental service features. The new service is priced to make its use by rivals unprofitable.

<sup>69</sup> This is another instance of disadvantaging a rival by raising the cost of production for such firms. See *ibid.*

<sup>70</sup> More specifically, bundling refers to two services offered in fixed proportions. *Pure bundling* means that the two services cannot be purchased separately. *Mixed bundling* means that both the bundle and the components of the bundle can be purchased separately. The seminal reference on bundling is W.J. Adams and Janet L. Yellen, "Commodity Bundling and the Burden of Monopoly," *Quarterly Journal of Economics* 90 (August 1976):475-98. Also see Louis Philips, *The Economics of Price Discrimination* (Cambridge, U.K.: Cambridge University Press, 1983), Chapter 11.

<sup>71</sup> The later possibility is analogous to "connecting arrangements" (CAs) required by the pre-divestiture Bell Operating Companies before non-telephone company terminal equipment could be attached to LEC loop plant. CAs were tariffed at levels that generally made the purchase and usage of competitive terminal equipment uneconomical for single-line telephone customers. For further discussion, see Brock, *The Telecommunications Industry*, Chapter 9.

<sup>72</sup> The LEC may assert that a service requested by a competitor can only be made available as part of a service bundle for transaction cost-minimizing reasons. Thus, the LEC may claim that certain parts of the bundle are essential to the proper functioning of the other components provided in the package. Thus, failure to provide the entire service bundle to the competitor may cause harm to transaction-specific investments made by the LEC. The proper evaluation of such arguments requires a careful examination of the extent of *specific* and *nonspecific* costs implied by the special purpose and general purpose technologies used to provide the services to competitors. Such an evaluation should reveal whether or not any part of the service bundle may be properly viewed as a transaction safeguard. See Appendix B for a discussion of specific and non-specific costs.

5. The LEC may contend that it is technically infeasible to supply a service or facility requested by a rival while at the same time providing connectivity to end-users that enable them to bypass the use of services that the LEC's rivals propose to offer.<sup>73</sup>

Although Williamson's simple contracting schema is helpful in sorting out potential obstacles to efficient transactions between LECs and their rivals, it is difficult for regulatory authorities to distinguish between valid transaction cost-minimizing contentions of dominant carriers and arguments driven by strategic intent to disadvantage rivals. Clearly, regulators are disadvantaged by the fundamental information asymmetry between the regulator and the dominant carrier.<sup>74</sup> Other than relying upon a strong, experienced technical staff that can evaluate the technical contentions of the LECs and their rivals, regulatory authorities can sometimes use a negotiating process among regulated carriers and their competitors to expose essential information that would otherwise remain undisclosed to regulatory authorities.<sup>75</sup> Such a process, if carefully designed and conducted by regulatory authorities, may provide an effective mechanism for resolving or mediating *ex post* transactional difficulties between LECs and their rivals.

The potential scope of negotiations between LECs and their competitors may be quite broad. Transaction cost economics suggests that not all behavior of the LECs towards their rivals is necessarily strategic and may reflect in part transactional difficulties attributed to asset specificity in supplying the interconnection and other services requested by competitors. Negotiations between LECs and their rivals under the sponsorship and supervision of the FCC could be used to (1) clarify the technical basis of asset-specificity problems; (2) determine the extent of specific costs implied by alternative technologies for meeting the requirements of competitors together with

<sup>73</sup> This problem is endemic in cases of "systems rivalry." A provocative analysis of such strategic behavior is provided by Janusz A. Ordover and Robert D. Willig, "An Economic Definition of Predation: Pricing and Product Innovation," *Yale Law Journal* 91 (November 1981):8-53.

<sup>74</sup> Information asymmetry is a basic hazard to any regulatory scheme that is heavily dependent on data provided by the regulated firm. A substantial economics literature addresses the various implications of this phenomenon. For an accessible survey of major contributions to this literature, see Kenneth Train, *Optimal Regulation: The Economic Theory of Natural Monopoly* (Cambridge, Mass.: The MIT Press, 1991).

<sup>75</sup> Successful negotiations leading to an acceptable exchange relationship between the dominant carrier and its rivals that also satisfies some public interest criteria established by regulatory authorities must meet certain conditions, including a default outcome if no agreement can be reached. For a discussion of this mechanism for effectuating regulatory objectives, see Roy L. Morris and Robert S. Preece, "Negotiating for Improved Interconnection: The Incentives to Bargain," FCC Office of Plans and Policy *Working Paper* No. 7 (January 1982, revised April 1982).

reasonable safeguards to protect against dedicated asset-specificity problems; (3) discuss alternative tariff structures for LEC access services both with and without *hostages*;<sup>76</sup> (4) consider the possibility of reciprocal trading as a way to strengthen technical communications between LECs and alternative access providers; (5) develop informal dispute resolution processes to avoid the delays inherent in formal regulatory complaint procedures; and (6) explore alternative technical standards for new types of network interconnections. This list does not, of course, exhaust the possible opportunities for beneficial negotiations between LECs and their competitors. It illustrates, however, how the process of negotiations might be able to overcome significant transactional barriers to market exchange and avoid years of formal regulatory rulemakings and judicial activity that are inefficient processes for addressing complex transactional issues.

*Inefficient Industry Structure.* The emergence of competition in local telecommunications markets represents a reorganization of a sector of the U.S. domestic telecommunications industry long dominated by vertically-integrated LECs. As competitors emerge in local telecommunications markets, there also exist certain pressures to reintegrate LECs in new ways, e.g., the proposed merger of certain former Bell Operating Companies with cable television companies and the entry of the post-divestiture Bell Operating Companies into interLATA long distance telecommunications markets. Do these countervailing pressures mean that competition in local telecommunications markets is inherently non-sustainable? Which model represents an efficient industry structure for local telecommunications services: integrated dominant firms or an industry populated by interconnected but rivalrous and technologically-diverse firms supplying an array of differentiated local telecommunications services?

Viewed from the perspective of transaction cost economics, the possible reintegration of LECs means that transactions are removed from markets and effectuated within firms.<sup>77</sup> Such integration may minimize transaction cost if it is inefficient to write a contract that anticipates every hazard that may thwart market exchange. Williamson's simple contracting schema identifies the major factors that

<sup>76</sup> The notion of a hostage is discussed in Appendix B.

<sup>77</sup> Thus, a customer could buy from a Bell Operating Company a "bundle" of local and long distance telephone service if the company were permitted entry into the interLATA long distance market. The customer would make a single market transaction rather than two: the Bell Operating Company would acquire long distance services for the customer using transactions internal to the firm.

may impede voluntary market exchange and, therefore, undermine the long-term sustainability of competitive industry structure.

As Williamson emphasizes, the decision to substitute hierarchy, or internal organization of the firm, for market exchange should not depend entirely on the possible transaction cost savings that may result from vertical integration. Rather, Williamson explains that

... [T]he object is not to economize on transaction costs but to economize in both transaction and neoclassical production cost respects. Whether transaction cost economies are realized at the expense of scale economies or scope economies thus needs to be assessed. A tradeoff framework is needed to examine the production cost and governance cost ramifications of alternative modes of organization simultaneously. . . .<sup>78</sup>

As the previous discussion anticipates, the extent of asset specificity is the pivotal factor that favors vertical integration from a transaction cost perspective. In its absence, use of market exchange between different stages of production tends to minimize transaction cost relative to hierarchy.

To illustrate the transaction cost logic that supports a decision to integrate various stages of production, such as the integrated supply of local and long distance telephone service, suppose that the level of output produced is held constant and that there exist negligible economies of scale and scope if different stages of production are integrated. In general, markets provide high-powered incentives for production cost control, although markets may become an inefficient governance structure as a bilateral dependency relationship develops between contracting parties. This latter effect is a result of the *fundamental transformation* that emerges as the extent of asset specificity deepens.<sup>79</sup>

Suppose that  $\beta(k)$  measures the bureaucratic costs of internal firm governance or hierarchy and that  $M(k)$  measures the corresponding governance costs of using markets to effectuate a transaction, where  $k$  is an index of asset specificity. Further suppose that  $\beta(0) > M(0)$ , since market exchange is more efficient in controlling production costs compared to the use of hierarchy in the case where asset specificity is zero. Also assume that the shape of  $M(k)$  is steeper compared to  $\beta(k)$  for every value of  $k$ , since markets are a less efficient transactional mode in terms of adaptability respects. Figure 4 plots the relationship  $\Delta G = \beta(k) - M(k)$ , where  $\Delta G$  measures the difference in governance cost between using hierarchy and markets to effectuate transactions.<sup>80</sup>

<sup>78</sup> Williamson, *The Economic Institutions of Capitalism*, p. 61.

<sup>79</sup> *Ibid.*, pp. 90-91. Appendix B discusses the concept of the fundamental transformation.

<sup>80</sup> Figure 4 reproduces Figure 4-1 in *ibid.*, p. 91.

The curve  $\Delta G$  in Figure 4 suggests that hierarchy is the more costly governance structure where asset specificity is slight, given the incentive and bureaucratic infirmities of internal organization in controlling production costs. Conversely, internal organization is more efficient where asset specificity is great, since a high degree of bilateral dependency exists in such cases, and markets are less well adapted to making continuing adaptive, sequential adjustments in response to disturbances in the exchange relationship. The switchover point,  $\bar{k}$ , shows where the choice between market or hierarchy is one of indifference.<sup>81</sup>

Williamson's analysis may be extended to allow for non-negligible economies of scale and scope in production.<sup>82</sup> Although the entire logic of this more complete analysis is not summarized here, it is noted that using internal organization rather than market exchange to produce a standardized product implies a substantial cost penalty, since markets aggregate demands so that economies of scale and scope can be realized. As goods and services become virtually unique (implying that  $k$  is high), aggregation economies provided by markets can no longer be realized; contracting with other firms to produce output that the firm could make itself does not result in either economies of scale or scope in this case. Thus, the firm can produce the unique product more cheaply itself rather than contracting for its production with other firms.<sup>83</sup>

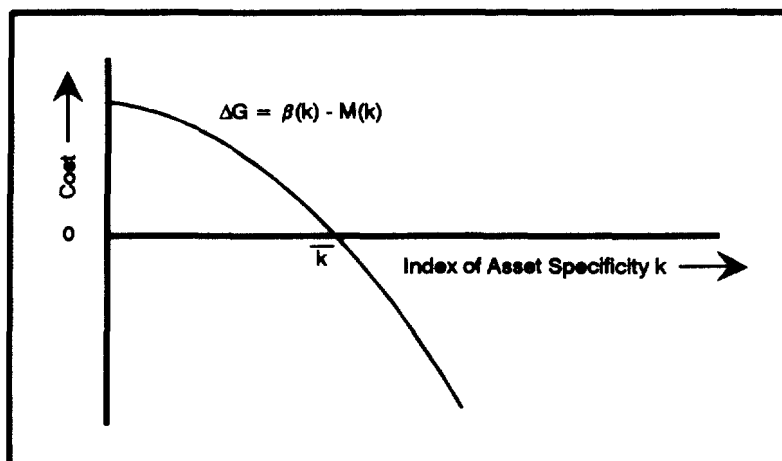


Figure 4—Comparative Governance Cost

The essential idea is that production and governance costs *taken together* should be *minimized* for any specified level of asset specificity. As shown by Williamson, the consequence of this joint minimization is that the presence of non-negligible economies of scale and scope tends to favor markets as the efficient transaction mode over a wider range of asset specificity values that would otherwise be the case in the absence of such production economies.<sup>84</sup> As a result, the crossover value of  $k$ , shown as  $\bar{k}$  in Figure 4, is shifted farther to the right of  $\bar{k}$  along the  $k$  axis in Figure 4.

<sup>81</sup> *Ibid.*

<sup>82</sup> See *ibid.*, pp. 92-95.

<sup>83</sup> *Ibid.*, p. 92.

<sup>84</sup> *Ibid.*, p. 93.

Williamson's analysis of the minimization of governance and production cost emphasizes that asset specificity affects not only the efficacy of transactions effectuated using market exchange, but also has major implications for the economic organization of an industry. Moreover, it is the nature of governance costs, not production costs, that will most affect the extent of integration within an industry. As Williamson observes, "... inasmuch as the firm [i.e., the use of internal organization] is everywhere at a disadvantage to the market in production cost respects . . . the firm will never integrate for production cost reasons alone. Only when contracting difficulties intrude does the firm and market comparison support vertical integration. . . ."<sup>85</sup>

To the extent that the evolution of technology in the supply of end-user and carrier services by LECs implies a deepening of asset specificity in order to produce such services, economic pressure will build to replace market exchange with internal organization through vertical organization. Given dominant firm strategic behavior, the pressure to integrate, however, may represent an entry-detering strategy rather than a strategy for minimizing transaction cost in response to growing asset specificity. The possibility of such dominant firm strategies to frustrate the development of competition in local exchange markets underscores the pivotal role of regulation during the early years of the reorganization of a regulated dominant firm industry.

In brief, a transaction cost analysis of the emerging reorganization of the local telecommunications services industry away from a local monopoly industry structure toward a diverse, multi-vendor industry model suggests the following role for federal regulation:

1. The choice of special-purpose instead of general-purpose technology by LECs may represent a strategic decision to deepen asset specificity that, in turn, may provide a rationale for integration. Regulatory scrutiny of LEC investment decisions during the early phases of competitive entry is essential to determine what effect the choice of technology will have on transaction cost and the sustainability of market exchange and competition.
2. Even if the emerging pattern of consumer demand for LEC services and facilities requires more LEC investment in transaction-specific assets, market exchange may still be the most efficient transactional mode *if* regulatory authorities establish both rules and processes, formal and informal, for resolving *ex post* transactional disputes. Such regulatory rules and processes are viewed in a very different way than is customary: such regulatory activity *reduces the transaction cost of using markets* in the face of possible contracting problems implied by deepening asset specificity. As a result, the powerful

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<sup>85</sup> *Ibid.*, p. 94.



incentives provided by a rivalrous market to reduce the cost of production and provide consumers with the goods and services that are wanted are preserved.<sup>86</sup>

3. As the local telecommunications service industry evolves, the FCC may need to define new property rights that are currently undefined or latent within the public utility concept. As government policy evolves toward an open entry industry model, rights and obligations inherent in the former industry structure must evolve as well.<sup>87</sup>

### ***2.3 Phases in the Development of Competition in Local Telecommunications Services***

The foregoing discussion can be placed in an evolutionary context that reflects certain phases in the development of competition as actually experienced in both the terminal equipment and long distance telecommunications markets. Such phases have no "sharp edges" and follow no predictable timetable, although certain *defining events* appear as markers suggesting that the development of competition has reached a point where further change will be qualitatively different from the past. These phases are not necessarily delineated in structural terms, such as market share achieved or measured changes in the market power of dominant firms. Rather, phases are identified more in terms of the status of property rights and transactional cost considerations as discussed in this paper. This delineation of phases of competitive development in telecommunications is viewed as a *complement* to the

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<sup>86</sup> This role of regulation as a mechanism for reducing transaction cost by addressing the hazards to exchange implied by asset specificity may seem unusual, since it contravenes a more common view that deregulation will foster the development of competitive markets. The point here is that a new focus of regulatory intervention is essential to foster competition in local telecommunications markets that will be sustainable over the longer term. A similar point is emphasized by Meyer and Tye in their article, "Toward Achieving Workable Competition in Industries Undergoing a Transition to Deregulation: A Contractual Equilibrium Approach."

<sup>87</sup> Definition of new rights could have a dramatic effect on market conduct and performance. Suppose, for example, that the existing vertical integration between LEC local loop plant and local switching facilities were replaced by a "market interface." Thus, one firm would provide "loop access services" that would be sold to one—or more—companies that would provide "switching services." Such an industry structure would resemble the organization of the airline industry, where the airlines do not own airports but obtain the services of airports pursuant to market exchange, i.e., through a long-term contractual relationship. Behavioral incentives would change dramatically, as the loop access companies would eagerly seek the business of switching companies. Such access companies would have strong incentives to provide diverse interconnection services to attract the business of switching companies. Regulatory intervention would remain essential, however, in this industry model in order to offset transactional difficulties attributed to asset specificity, especially the substantial sunk cost investment in loop plant.